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PSYCHE

VOL. XLIII DECEMBER, 1936 No. 4

NEW SPECIES OF SOUTHERN SPIDERS

By Elizabeth B. Bryant

Museum of Comparative Zoölogy

Cambridge, Mass.

During the winter and spring of 1935 a student at Southern Methodist University collected spiders throughout Dallas County, Texas. It is a section of the country from which little is known of the spider fauna. Among them were five new species and the male of a species known only from the type from Okefenokee Swamp, Georgia. From a small collection from Florida two species were found to be new and from the Florida Keys was found a male of a Cuban species known only from the female. Many species of spiders have been found to be common to Florida and Texas.

OECOBIIDAE

Oecobius texanus sp. nov.

Fig. 8, a, b, c, d, e

Female. Length, 2.5 mm.; ceph., 0.7 mm.; abd., 1.6 mm.; width of ceph. 0.8 mm.

Cephalothorax yellowish white with a dark margin and median area from eyes to posterior margin shaded with dark gray, black about eyes, broader than long, thoracic groove long and lightly impressed, clypeus protruding and shaded with gray; eyes closely grouped on a distinct elevation which falls away on all sides, anterior row procurved, a.m.e. largest of eight, round and dark, separated by more than a diameter and almost touching a.l.e. which are half the size, flat and white, posterior row about the same length, strongly procurved, p.l.e. little smaller than a.m.e., round and dark and almost touching a.m.e., p.m.e. flat, white and triangular, separated by their long diameter; quadrangle of median eyes slightly wider in front and as high as wide; clypeus protruding and longer than quadrangle with a few colorless hairs at margin and a pair of very long hairs projecting forward directly above a.m.e.; mandibles colorless, weak and covered with long hairs, many with globular tips, fang impossible to see; labium triangular, as high as wide at base; maxillæ pale with many hairs, curved and almost

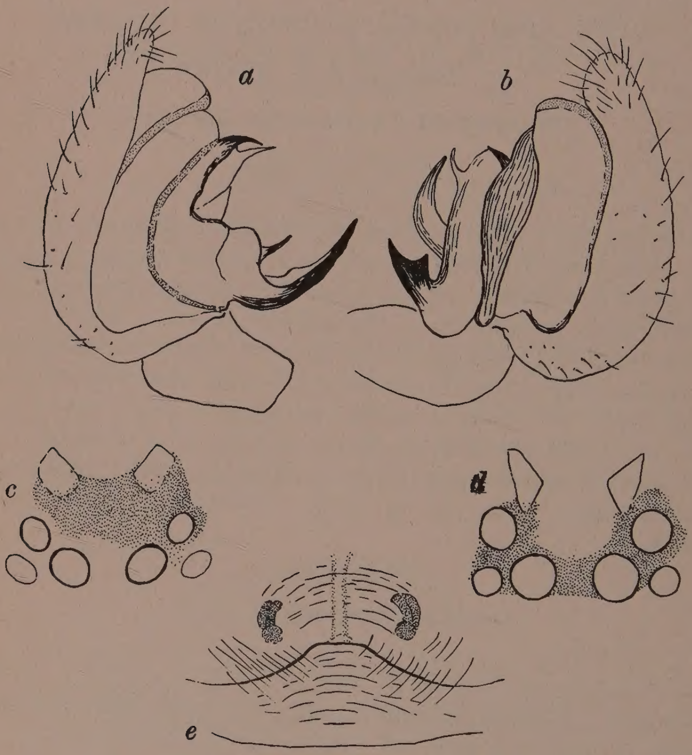


Fig. 1. a, and b, left palpus; c, eyes (male); d, eyes (female); e, epigynum.

surrounding labium, pedipalps colorless, long and parallel, extending forward with a single claw; sternum colorless, wider than long, margins with many short hairs; abdomen oval, two thirds as wide as long, base slightly bilobed, a dull tan thickly covered with irregular chalky white spots, entire abdomen sparsely covered with very long colorless hairs, venter paler with the same chalky white spots; legs colorless with no indication of dark rings, hairy with many bristles that can hardly be called spines, I and II femora with a double row of heavy bristles, calamistrum double, extending over little more than the basal half of IV metatarsus; spinnerets protruding, of the usual type; epigynum with a bilobed chitinized margin thinly fringed with long colorless hairs above a slightly darkened area with transverse wrinkles; above the chitinized margin are two widely separated darkened areas.

Male. Length, 2.0 mm.; ceph., 0.8 mm.; abd., 1.3 mm.; width of the cephalothorax 1.0 mm.

Cephalothorax, pale as in female but without the dark margin, eye elevation higher than in female so that clypeus is almost vertical; palpus long, femora parallel, patella and tibia about equal length, terminal joint brown and palpal organ dark brown, projecting from cymbium quite the length of the joint as figured.

Holotype ♂ Texas; Dallas, 17 March, 1935, (S. Jones).
Allotype ♀ Texas; Dallas, 28 March, 1935, (S. Jones).
Paratype ♂ Texas; Dallas, 14 June, 1935, (S. Jones).
Paratype ♀ Texas; Dallas, 13 May, 1935, (S. Jones).

This genus has been represented in the United States by *Oecobius parietalis* (Hentz) found in the southern states. Chamberlin and Ivie have made a revision of the American species of the family in Ann. Ent. Soc. Amer., 1935, 28, pp. 262-272, pls. 1-4. They have described a new species *Oecobius isolatus* from immature females found at Carmen Island, Gulf of California and Sycamore Creek, Arizona. This species has heavily annulated legs and a carapace blackish. The relative position of the eyes is not given.

As so many small spiders are carried by commerce, it was thought that there was a possibility that this species might be *Oecobius maculatus* Simon, the species found about the Mediterranean. As there were no specimens of this species in the museum collection, drawings of the Texan species were sent to the Paris Museum and M. Berland kindly compared them with the two European species. It was found to be different from either.

AGELENIDAE

Tegenaria simplex sp. nov.

Fig. 9

Female. Length, ceph., 2.2 mm.; abd., 3.1 mm.

Cephalothorax light yellowish brown, cephalic portion high, outlined with a broad stripe of dusky gray which continues to the posterior margin, lateral margins with a narrow black line and fringed with long dark hairs directed forward, thoracic groove long; eyes cover little more than middle half of the head, anterior row slightly procurved, eyes equidistant, a.m.e. smallest of the eight, separated by less than a radius, posterior row little longer than anterior, eyes equidistant, p.m.e. largest of the eight, separated by a diameter, lateral eyes almost touching and subequal; quadrangle of median eyes narrower in front and higher than wide; clypeus more than a diameter of a.m.e.; mandibles vertical, long, front surface flat with many black bristles, fang groove oblique, superior margin with scopula of long hairs, four distinct teeth, inferior margin with four teeth, fang long; labium as high as wide, tip rebordered, lateral margins almost parallel and excavate at basal fourth; maxillæ twice as long as labium with sides parallel; sternum with broad lateral dark stripes broken by two pairs of light spots opposite I and II coxæ, as wide as long, sides almost parallel between I, II and III coxæ, tip continued in a slender point between IV coxæ; abdomen two-thirds as wide as long, pale yellow with the usual grayish marks, tip much darker, venter pale with a gray rectangle from fold to spinnerets, containing two pale poorly defined parallel stripes; spinnerets, superior pair with long basal joint, terminal joint about two-thirds as long, inferior pair shorter than basal joint of superior; legs long and slender, IV pair missing, pale, femora darker with faint gray rings;

epigynum dark reddish-brown, with margins heavily chitinized, openings small and round, widely separated leading by spiral tubes to sacs above.

Holotype ♀ Texas; Dallas, near Southern Methodist University, 5 April, 1935.

This species is marked like *Tegenaria cavicola* Banks, from Salt Petre Cave, Indiana. Unfortunately the type of this species is immature. The posterior row of eyes is not as strongly procurved as in *Tegenaria domestica* but the epigynum has the same broad lobe. It differs from *Tegenaria obscura* Banks, described from a single female by the different proportion in length of the joints of the spinnerets and position of eyes of posterior row.

LYCOSIDAE

Schizocosa perplexa sp. nov.

Fig. 2

Male. Length, 9.0 mm.; ceph., 5.0 mm.; abd., 4.0 mm.

Cephalothorax with light stripe from second eye row to posterior margin, with sides evenly converging from the posterior eyes so that width at posterior margin less than half the greatest width, covered with short white hairs, sides brown, thickly covered with short black hairs, no indications of submarginal light stripe, very dark about eyes; eyes anterior row shorter than second row, a.m.e. separated by little over a radius, larger than a.l.e. and separated from them by less than a radius, eyes of second row separated by about a diameter; mandibles dark brown, covered with long black hairs, vertical, superior margin of fang groove with three teeth, middle largest, inferior margin with three subequal teeth; labium higher than wide, lateral excavations at base about one third the length; maxillæ twice as high as labium; sternum and coxæ light; abdomen with light brown basal stripe which disappears about middle; in this the usual spear-mark can be traced outlined by black dots, sides black, entire abdomen thickly covered with long dark hairs and a few longer white hairs at base on light stripe; venter dark with a few scattered lighter spots and a narrow, median light stripe from fold to spinnerets; legs, I left, II right missing, I leg darkest, others same color as light stripe of cephalothorax, I tibia thickly covered with short erect black hairs, metatarsus with dark hairs not as numerous, these black hairs not as long as diameter of joint and much shorter than in *Schizocosa ocreata* (Hentz), spines, I tibia, dorsal 0, ventral, 2-2-2, basal and median pairs not overlapping, 1 lateral, metatarsus, 2-2, 1 lateral, posterior pairs spiny, III and IV tibiæ with dorsal basal and median spines; palpus, same color as legs, not as long as cephalothorax, seen from above, patella little longer than tibia, tibia only slightly swollen, not as broad as long, a small dark dorsal cusp extending towards cymbium, palpal organ lacking horn, principal tenaculum about the middle, unequally bidentate, lesser tenaculum situated above the middle, bent at right angles and turned downwards, above and parallel with the distal half is another slightly smaller process.

Holotype ♂, Texas; Dallas, Garland Swimming Pool, 25 March 1935 (S. Jones).

This species is a little larger than *Schizocosa puebla* Chamb. from Albuquerque, New Mexico, and is easily separated by the darker first leg, and tibia of the palpus shorter than patella and very different palpus.

OXYOPIDAE

Oxyopes helius Chamberlin

Fig. 7

Ent. News, 1929, 40, p. 19, fig. 4.

Male. Length, 4.0 mm.; ceph., 2.0 mm.; abd., 4.0 mm.

Cephalothorax with median light stripe starting from p.l.e., constricted to half that width at thoracic groove, suddenly widening and narrowed at posterior margin to same width as thoracic groove, dark lateral stripes about the same width as median light stripe with irregular margins on each side and extending below eyes on clypeus, sides light yellow with patches of white scales, thoracic groove long and faintly impressed; eyes, anterior row strongly recurved, a.m.e. smallest of eight, separated by a little more than a diameter and from a.l.e. by a diameter, a.l.e.

separated by almost two diameters and subequal with eyes of posterior row, slightly nearer a.m.e. than to p.l.e., posterior row of eyes strongly procurved, longer than anterior row, subequal and equidistant; quadrangle of median eyes much narrower in front, quadrangle of a.l.e. and p.m.e. of same width in front as behind and slightly wider than high; clypeus, very dark, showing no trace of vertical lines, three quarters as high as quadrangle of median eyes; mandibles small and dark, front surface light brown with a broad dark blotch, fang and fang groove short; sternum triangular, light yellow, margins heavily shaded in dark gray; coxæ light with dark margins; abdomen dark with no definite pattern, venter very dark; legs, without the dark longitudinal lines found in *O. salticus,* femora and tibiæ shaded with gray, very dark in ventral surface; palpus very dark, cymbium thickly covered with short black hairs and without the conspicuous conical dorsal prominence found in *O. salticus;* patella seen from above longer than tibia, as long as broad with several strong, dark apophyses on ventral side and a hammer shaped light lateral apophysis, tibia with a single enlargement at tip on ventral side which probably interlocks with a process on the patella; palpal organ of the usual type and completely filling the cavity.

Allotype ♂ Texas; Kaufman, 3 miles E. of Parson's Slough, 13 May 1935, (S. Jones).

The holotype was described from a female from Okefenokee Swamp, Georgia. Both male and female were taken at Parson's Slough, Texas. The male differs from any species found in North America and Mexico by the processes on the patella, as all known species have the processes on the tibia and patella smooth. Simon states that *O. lepidus* Blackw. (*similaris* Stol.) has a process on the patella.

DRASSIDAE

Nodocion agilis sp. nov.

Fig. 3

Male. Length, 5.0 mm.; ceph., 2.5 mm.; abd., 2.8 mm. Cephalothorax, a golden brown, smooth and shining with a few hairs on posterior half, low, much narrowed in front, sides evenly rounded, thoracic groove short but distinct, radical striæ indistinct; eyes closely grouped covering two thirds of the head, anterior row weakly procurved, a.m.e. smallest of eight, separated by a little less than diameter and almost touching the flat and much larger a.l.e., posterior row same length as anterior, slightly procurved, p.m.e. angular, about the same size as p.l.e., separated by less than short diameter and from p.l.e. by even less, p.l.e. slightly smaller than a.l.e. and separated from them by less than diameter of the latter; quadrangle of median eyes narrower behind and higher than wide; clypeus little wider than diameter of a.m.e.; mandibles brown, vertical, median half thickly covered with short black bristles directed inward so as to form a thick brush, fang groove short, no teeth on either margin, fang weak; labium, narrower than high, sides almost parallel, palpi inserted beyond the middle of the maxillæ, tips inclined over labium; sternum bright yellow with a few stiff black bristles about the margin, three-quarters as wide as long, IV coxæ separated by less than half a diameter, I coxæ longer than IV, all coxæ can be seen from dorsal side beyond cephalothorax; abdomen a dull gray thickly covered with short stiff hairs, longer at base, venter lighter, inferior spinnerets separated by more than a diameter; legs, IV right leg missing, I leg longest, femur enlarged and flattened laterally, spines, I and II, femur, 1-1, dorsal, patella, tibia and metatarsus, 0, III and IV, femur, 1-1 dorsal, patella, tibia, dorsal O, several lateral and ventral not in pairs; palpus about as long as cephalothorax, febur longer than patella + tibia, tibia two-thirds as long as patella, tibial spur almost as long as joint, longer than diameter, pressed close to cymbium two thirds length and then bent outward, tip truncate, palpal organ completely filling cavity, embolus arising from near the tip making a sharp turn backwards and ending in a slender tip on the cymbium, on the opposite margin about the middle is a short black spur or spine parallel to the plane of the cavity.

Holotype ♂ Texas; Dallas, house on Oak Cliff, 15 May, 1935, (S. Jones).

The genus was based on a female from California. Chamberlin described one male that has a similar palpal organ but differs from the Texas species by the proportion of the joints of the palpus and the much longer tibial spur.

Drassyllus pullus sp. nov.

Fig. 4, 5

Male. Length, 5.1 mm.; ceph., 2.2 mm.; abd., 3.0 mm.

Cephalothorax dark brown with no light area, thoracic groove short but distinct, sides evenly rounded, front margin about same width as posterior; eyes covering middle half of head, anterior row straight, a.m.e. smallest of eight, separated by less than a diameter and from a.l.e. by less than a radius, a.l.e. largest of eight, posterior row a little longer than anterior row, straight, p.m.e. little smaller than a.l.e. round, separated by a diameter and from p.l.e. by less; quadrangle of median eyes slightly narrower in front and higher than wide; clypeus less than diameter of a.m.e.; mandibles dark brown, vertical, median margin covered with long bristles, fang groove slightly oblique, superior margin with numerous stiff bristles and two subequal teeth, inferior margin with three small teeth, fang stout at base and evenly curved; labium higher than wide, lateral margin excavate at basal third then sides slightly inclined towards tip; maxillæ once and a half times as high as labium; palpi inserted very near the tip; maxillæ distinctly impressed; sternum brown, two-thirds as wide as long, ending in a blunt point in front of IV coxæ, sides with numerous long bristles; abdomen oval, a dark gray, thinly covered with long hairs, basal scutum very distinct extending one third length of abdomen, venter pale, with a scutum separate from dorsal and extending from pedicle to fold; inferior spinnerets separated by more than a diameter; legs, I pair, and II right missing, dark with many long hairs and bristles, spines, II tibia, O spines ventral or lateral, metatarsus, 2 basal, rather weak, IV tibia, O spines dorsal but a lateral pair; palpus not as long as cephalothorax, seen from above patella longer than tibia, tibia longer than wide, tibial apophysis longer than joint and extends one half length of cymbium, slender and smooth, embolus, short, starting from near the tip, making an abrupt turn soon after its origin, on opposite side of tip a slender black spine which extends slightly outside on cymbium, seen from the side between the embolus and the black spine are two leaf-like pieces with dark margins which cover the parts at the tip like a veil; at base of the organ is a dark round knob.

Holotype 1 ♂ Florida; Coral Gables, 17 June, 1935 (O. C. Webb).

Herpyllus faxoni sp. nov.

Fig. 6

Female. Length, exclusive of spinnerets, 7.5 mm.; ceph., 3.5 mm.; abd., 4.0 mm.; width of abd., 2.6 mm.

Cephalothorax golden brown, covered with fine white hairs and long scattered black hairs, widest between second and third pair of legs, much narrowed anteriorly, gently rounded, thoracic groove distinct; eyes, anterior row slightly recurved, a.m.e. largest of the eight, separated by a radius and almost touching a.l.e., posterior row procurved so that anterior margin of p.m.e. and middle of p.l.e. form a straight line, p.m.e. slightly angulate rather than oval, separated by a little more than their long diameter and by a little less from p.l.e., lateral eyes subequal and separated by less than a diameter; quadrangle of median eyes wider in front and slightly higher than wide; clypeus about one-half diameter of a.m.e.; mandibles vertical, cone shaped, brown covered with long black hairs, fang groove short, inferior margin with no teeth, superior margin with very small nodules, fang short; labium almost twice as high as wide, lateral margins at basal third slightly excavate; maxillæ not twice as high as labium, only slightly impressed, slightly inclined over labium, upper margins rounded; sternum oval, slightly narrowed between first coxæ, lateral margins slightly emarginate, tip obtusely pointed in front of fourth coxæ; abdomen dark gray with a median light stripe, wide at base, sides converging and almost meeting at middle and continuing on posterior half as a much narrower spot that does not reach tip; venter light gray; legs, left III missing, 4-1-2-3, same color as cephalothorax, thinly covered with fine dark hairs, anterior metatarsi and tarsi with dense scopula, spines, I tibia, I-I-I, basal, median and apical, left tibia with basal spine missing, metatarsus, 2 basal, II tibia, I-I, median and apical, spines more numerous on posterior pairs, III tibia, dorsal, I basal spine, IV tibia dorsal, O spine; epigynum, the openings a short distance above the fold, connected with fold by a heavily chitinized groove, above are the round receptacles separated by half a diameter.

Holotype ♀ Florida; Sebastian, February, 1932, (G. Nelson).

This species differs from others found in Florida by the procurved row of posterior eyes, quadrangles of median eyes wider in front, and the lack of dorsal spine on the IV tibia. *Herpyllus cratus* Chamb., also from Florida, is immature and so is difficult to place. It is much darker in color, possibly due to the length of time it has been in alcohol, it is larger, the spines on the anterior tibiæ are not paired, the epigynum while showing the chitinized grooves will be evidently much longer, but it has a dorsal spine at the base of III tibia and none at the base of IV tibia.

CLUBIONIDAE

Clubiona transversa sp. nov.

Fig. 8

Female. Length, 8.6 mm.; ceph., 3.1 mm.; abd., 5.5 mm.

Cephalothorax pale yellow shading to brown near the eyes, sides almost parallel, front broad, thoracic groove distinct; eyes, anterior row straight, eyes subequal and equidistant, separated by less than a diameter, posterior row longer than anterior, covering almost entire width of head, straight or very slightly procurved, eyes subequal p.m.e. slightly nearer p.l.e. than to each other; quadrangle of median eyes narrower in front and wider behind than high; clypeus less than a radius of a.m.e.; mandibles very dark brown, swollen at base, long, boss small, fang groove slightly oblique, superior margin with one large tooth, preceded by several small teeth and followed by one medium sized tooth, inferior margin with two teeth, fang, stout and evenly curved; labium twice as high as wide, lateral margins excavate on basal third, tip slightly narrower than base; maxillæ twice as high as labium, tips slightly dilate; palpus inserted at basal third; sternum twice as long as wide, width of labium in front and pointed in front of IV coxæ; abdomen oval, twice as long as wide, pointed above spinnerets, a dirty white shading to a light brown at tip, venter pale with a faint dusky median line; legs, 4-1-2-3, right I and IV missing, pale dense scopula on anterior tarsi and metatarsi, faint scopula on distal half of anterior tibiæ, spines, I and II tibiæ, 2-2, long ventral, O lateral, metatarsi 2, basal, ventral, O lateral; epigynum wider than high, convex, with a dark narrow median septum which starts from a heavily chitinized ridge and curls under the fold midway in the clear area each side, starting from the median septum is a narrow dark transverse bar which does not reach outer margin, openings probably near the ends of the chitinized ridge.

Holotype ♀ Texas; Dallas, White Rock Lake, 25 March, 1935. (S. Jones).

Wulfila immaculata Banks

Fig. 1

Bull. Amer. Mus. Nat. Hist., 1914, 33, p. 640, pl. 43, fig. 7.

Male. Length, 4.0 mm.; ceph., 1.5 mm.; abd., 2.2 mm. (measurement of length is without mandibles and spinnerets).

Cephalothorax almost white, sparsely covered with colorless hairs, not very high, sides evenly rounded, thoracic groove a depression rather than a groove, at anterior outer corner is a darkened vertical cusp or spur similar to figure of *W. tropica* Petrunkevitch Trans. Conn. Acad., 1930, 31, p. 68, figs. 56 to 60; eyes, very little black pigment about eyes, anterior row slightly recurved, a.m.e. smallest of eight, separated by a scant diameter and from a.l.e. by more than a diameter, posterior row longer than anterior, procurved, eyes equidistant and subequal; quadrangle of median eyes narrower in front and as high as wide; clypeus one and a half diameters of a.m.e.; mandibles three-fifths as long as cephalothorax antenuate, outer margins parallel, fang groove long, oblique, superior margin with a distinct carina from base of fang ending in five teeth which extend on median margin, inferior margin illy defined and impossible to see any teeth; Petrunkevitch in redescribing the female *W. immaculata* states, Trans. Conn. Acad., 1930, 31, p. 85, that the mandible when stained and mounted on a slide shows a row of nine small teeth, very scant scopula on superior margin only, fang long and sinuous; labium higher than wide; maxillæ twice as long as labium, tips slightly widened, palpi inserted at basal third; sternum flat, oval, IV coxæ separated by a diameter; abdomen oval, more than twice as long as wide, colorless, spinnerets extending beyond tip, openings of tracheal spirale about middle; legs, I pair much the longest, fem., 3.0 mm.; pat. + tib., 4.6 mm.; metat., 4.1 mm.; tar., 2.0 mm.=13.7 mm. Spines colorless, femur, 3 dorsal serial, tibia, 2-2, ventral, 2 lateral, metatarsus, 2, basal, 2 lateral, spines more numerous on posterior legs; palpus, longer than cephalothorax, tibia longer than patella, but little over half as long a terminal joint, tibial apophysis a small abrupt cusp at right angles from the joint with three short spines on ventral side and several long bristles on exterior.

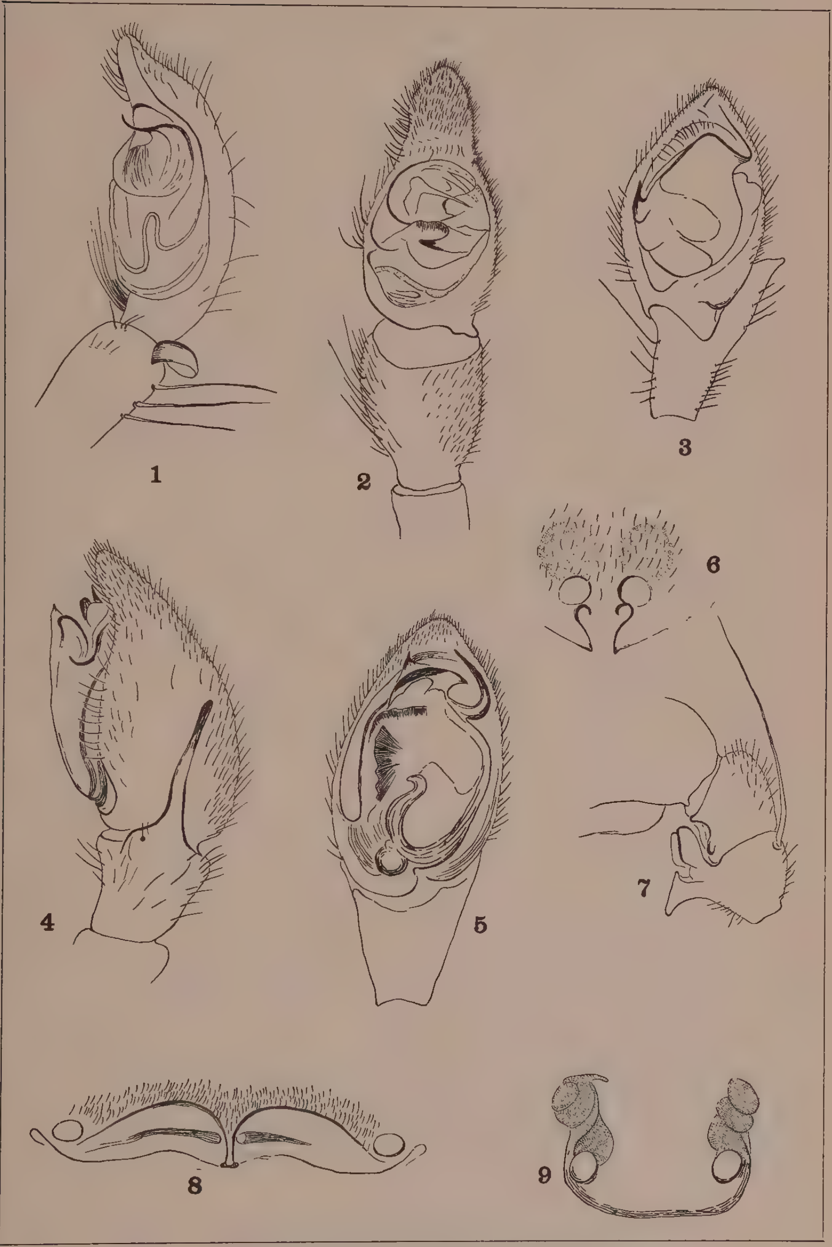
Allotype ♂ Florida; Bicknell's Hammock, 30 April, 1935 (Gribbins).

The type, a female from Vinales, Cuba, is in the American Museum of Natural History. It has been found since at Porto Rico and Mona. A female was taken at Siboney, Cuba, without the first pair of legs. Petrunkevitch gives a detailed description of the type female in Trans. Conn. Acad., 1930, p. 85, fig. 72. The male agrees with the female with the long first legs, the eyes, teeth on the mandibles and number of spines on the legs. The spines are difficult to see. It does not agree with the definition of the genus given by Petrunkevitch, 1930, p. 66, but probably when both sexes of all species are known, the difference in the number of spines will be modified. The cusps on the outer corners of the cephalothorax are evidently a secondary sexual character.

EXPLANATION OF PLATE III

Fig. 1. *Wulfila immaculata* Banks
Fig. 2. *Schizocosa perplexa* sp. n.
Fig. 3. *Nodocion agilis* sp. n.
Fig. 4. *Drassyllus pullus* sp. n.
Fig. 5. *Drassyllus pullus* sp. n.
Fig. 6. *Herpyllus faxoni* sp. n.
Fig. 7. *Oxyopes helius* Chamb.
Fig. 8. *Clubiona transversa* sp. n.
Fig. 9. *Tegenaria simplex* sp. n.

Psyche, 1936 VOL. 43, PLATE III



Bryant—New Southern Spiders

A NEW ŒDEMERID BEETLE FROM CUBA

By P. J. Darlington, Jr.
Museum of Comparative Zoölogy
Cambridge, Mass.

The following description of a new Cuban Oedemerid is published now so that the name will be available for use in a forthcoming paper on mimicry of the Lycid genus Thonalmus. Because of the present confusion among genera in the family Oedemeridæ, I have collected in a separate paragraph the characters which have led me to place the new species in the genus Copidita.

Copidita thonalmus n. sp.

Generic characters: Head not prolonged into a beak; eyes only shallowly emarginate behind insertions of antennæ; both mandibles bifid at apex; last segment maxillary palpi triangular but not broadly so; antennæ with segment 11 more or less divided; middle coxæ contiguous; front tibia with 2 spurs; penultimate segment of tarsi broadly lobed; tarsal claws angulate below but not toothed; ♂ 5th ventral segment not emarginate.

Specific characters: Body moderately stout for Copidita; color bright orange with apical ½ to ¾ of elytra dark blue or greenish blue, the line of demarcation of the colors somewhat irregular, the orange extending slightly toward apex at suture and margins, but not forming sutural and marginal stripes; eyes, antennæ, palpi, tips of mandibles, and legs black, except bases of femora orange; abdomen more or less dusky. Surface of head and pronotum slightly shining, although closely punctate except on very narrow poorly defined median stripe; elytra dull, closely punctate. Eyes not very prominent. Prothorax about one-tenth (by measurement) wider than long, subcordate, with base about three-quarters as wide as widest part and sides slightly sinuate before basal angles, which are not prominent. Elytra one-quarter (♂) to one-half (♀) wider than prothorax. Length 6.5.-8.0; width 1.9-2.4 mm.

Holotype ♂ (M. C. Z. no. 22464) (sex determined by dissection) and 4 paratypes from Janorú (Camagüey Province), Cuba, May 27, 1931, "taken on weeds" by L. C. Scaramuzza; 1 paratype from about 3,000 ft. altitude near Buenos Aires, Trinidad Mts. (Santa Clara Province), Cuba, May 8-14, 1936, taken by myself on an unidentified flowering tree.

The coloration of this beautiful Oedemerid is unique, so far as I have been able to find by an examination of the descriptions of all known West Indian and many Central American species, and an examination of North American species in the Leconte Collection. The color at once distinguishes *thonalmus* from the commoner Cuban *Copidita testaceicollis* (Jac.-Duval) (de la Sagra's *Histoire . . . de Cuba,* [Vol. 7] *Animaux Articulés,* 1857, p. 158), which has similar generic characters but is smaller, black, with vaguely bluish or greenish elytra and yellowish prothorax. The only other Oedemerid recorded from Cuba, *Asclera latior* Pic (*Mélanges exot.-ent. fasc.* 40, 1923 p. 32), is not known to me, but is described as similar in color to *testaceicollis.*

THE PERSIUS GROUP OF THANAOS (LEPIDOPTERA, HESPERIIDAE)

By William T. M. Forbes,

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This group has been a standing problem for many years. On the one hand, the superficial and genitalic differences of the adults are so small that the late Dr. Skinner and various other workers were convinced that there was only a single variable species. On the other hand, the earliest rearings showed that there were two widely divergent foodplants (columbine and willow or poplar), associated with visible differences in appearance of the butterflies; and later work has added Baptisia as a third,—each belonging to a different and widely separated family of plants. This for the East; in Arizona we must add *afranius* Lintner, and California has a complex that only local rearing can straighten out. In this paper I am taking the *persius* group in its strictest sense, comprising only the forms with genitalia of identical plan: socii rather long, equal in size and spike-like (one more curved than the other); left valve with three strong lobes, the middle one longitudinal in general direction, right valve two-lobed, with a short tooth on the upper outer angle of the lower lobe, to represent the middle lobe of the left side. This definition will include the three eastern types, afranius, and California specimens identical in structure with persius and afranius, but will exclude the Californian *lilius* and *callidus*, also *pernigra* if rightly identified at the National Museum. *T. avinoffi* of Alaska probably is also included, but has not been examined structurally.

I use the name Thanaos for familiarity. Erynnis may be defended on the basis of the code, but has no effective use in this sense, and substantial use in another subfamily; so should be excluded by a conservanda ruling if the code continues to function.

The present paper is drawn up from the eastern point of view. West of the Mississippi river there may be additional complications. There is a divergent looking form from Omaha, Nebraska (two specimens at hand); *afranius* shows some sign of complexity, that should be cleared up by more extensive rearing, and of the California material only that which could be placed in more eastern species has been analyzed. Lucilius and the Baptisia species appear to be absent from California, but there is a black species with the structure of *afranius* to complicate matters. True *persius* is more common in California than in the east, but has been generally mistaken there for *afranius*.

The crux of the confusion has been the current mistaking of the Baptisia species for *persius*, which has generally gone unrecognized, or been determined erroneously as *afranius*, —and back of this confusion is the fact that true *persius* is relatively scarce from the east in collections, and perhaps the slight miscoloring of Scudder's figure. Speaking generally Scudder, Holland and the U. S. National Museum had *persius* correctly identified, while Skinner, Lindsey and the Barnes collection had the Baptisia species standing as *persius*, with possibly a few scattered eastern specimens of true *persius*, while the main series of *persius* were western specimens and stood as *afranius*. The true *persius* has excellent genitalic characters, and east of the Rocky Mountains may be distinguished by its coating of long scattered white hairs on the disc of the forewing. In Arizona all the group become heavily covered with white, but in California I believe *persius* again is the only one with the white hairs.

Thanaos persius Scudder

1862. *Nisoniades persius* Scudder, Proc. Essex Inst. iii 170.

1870. *Nisoniades persius* Scudder & Burgess, Proc. Boston Soc. Nat. Hist. xiii, 286, fig. 1 (genitalia).

1889. *Thanaos persius* Scudder, Butt. E. N. A. ii, 1468-1476, pl. ix, fig. 1, xxxvi, fig. 1-3, etc. (colored figure perhaps contaminated with Baptisia species).

1872. *Nisoniades persius* Lintner, 23rd Rept. N. Y. State Cab. Nat. Hist. 165 (note), pl. vii, figs. 3, 4 (Ent. Cont. p. 33).

1898. *Thanaos persius* Holland, Butt. Book pl. xlviii, fig. 1, (a California specimen).

1921. *Thanaos persius*, race *afranius* Lindsey (approximately) Univ. Ia. Stud. ix (4), 52.[1]

1927. *Erynnis persius afranius* Comstock, Butt. Calif. 212 (in part), pl. lix, fig. 2 (not fig. 3).

1931. *Erynnis afranius* Lindsey, Bell & Williams, Denison Univ. Bull., Jour. Sci. Lab. xxvi, 62 (in part) (not *Nisoniades afranius* Lintner).

There is further bibliography in Scudd. '89, Lindsey '21 and '31, and Skinner Syn. Cat. No. Am. Rhopalocera, but the latter three must be used with caution on account of the confusion of species.

It would appear that Scudder had a pretty clear idea of this species, as shown by the type (whose genitalia I figure, fig. 5), the Scudder and Burgess figure of the genitalia, and the biological data and foodplants. But his figure shows too much brown, and may possibly have been contaminated by the Baptisia species. Holland figures it correctly from a California specimen[2], and the main series in the National Museum (representing Dyar's determination) is correct and pure; but Skinner failed to recognize it, most of his series being of the Baptisia species, which is far commoner in the east; and several later workers have followed his misidentification, apparently viewing the occasional eastern specimen as aberrant, and putting the western material in *afranius*.

Superficially *persius* can be instantly recognized in the east, and I believe in the Northwest and California, by the abundant hair on the base and disc of the fore wing, some of which is white, and the general smooth appearance, the pale spot over the end of the cell being gray when distinct. In Arizona the other species show the same pale hair, but can be distinguished by the genitalia. *Afranius* also differs as a rule in the paler outer margin of the fore wing, due to a large percent of white scales; on which the wedge-like black postmedial spots, and less defined submarginal and marginal ones contrast strongly. The pale fringe, emphasized by Lindsey, occurs in specimens of both types of genitalia, and is probably a dry climate modification of all the species.

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[1] This determination judged by the arrangement of the Barnes collection as deposited in the U. S. National Museum.

[2] The apparent transparent cell-spots are pin-holes.

The chief characters are: left valve with middle lobe much widened, separated from the upper lobe by less than its width, with a heavy keel on its inner face, extending about half way to the tip (present in a single aberrant or hybrid specimen of *afranius*); upper lobe with spinulation limited to its apical part; right valve with upper lobe massive, separated from lower by a narrow chink, its tip recurved into a massive, heavily spinulated hook, which invariably folds back on itself in the mounted valve, its outer lower edge not toothed, more or less lobed and hairy at the middle; the whole larger than in any *afranius* or *lucilius*, or most *baptisiæ*, being over 0.8 mm. long with few exceptions, and over 0.62 (⅝) mm. wide in all specimens seen. Lower lobe short and heavy, less than twice as long as upper lobe, its tip ending in a more or less distinct rounded thickening on inner side, and wholly without teeth. The whole structure, including the tegumen, is more massive than the other species. The broad middle lobe on the right side can be seen without dissection, but is set on obliquely and often seems narrower than it really is.

I have specimens before me from Bristol (fig. 1) and Johnston, R. I., New Haven, Conn., Crosby and Yapyank, N. Y., Eagle, Ala., and numerous western specimens, mostly from Col., Wyo., Alta. and Cal. The latter are generally mixed with *afranius*, but the massive genitalia will distinguish them; in fact some California specimens are more massive than the eastern ones. I have only seen spring dates from the east, though it flies in July in the Rocky Mountains, so I believe it is single brooded, in the spring where the climate permits.

In the remaining species the middle lobe of the right valve is slender, with a wide space between it and the upper; and its inner keel is weak and stops practically at its base; the upper lobe shows some tendency for the hair to extend down in a line to near the base of the middle lobe (especially in *afranius*); the upper lobe of the right valve is smaller, and its lower outer edge is not lobed and is more or less distinctly toothed; the lower lobe is long and slender and toothed at the tip (the teeth weak or occasionally ab-

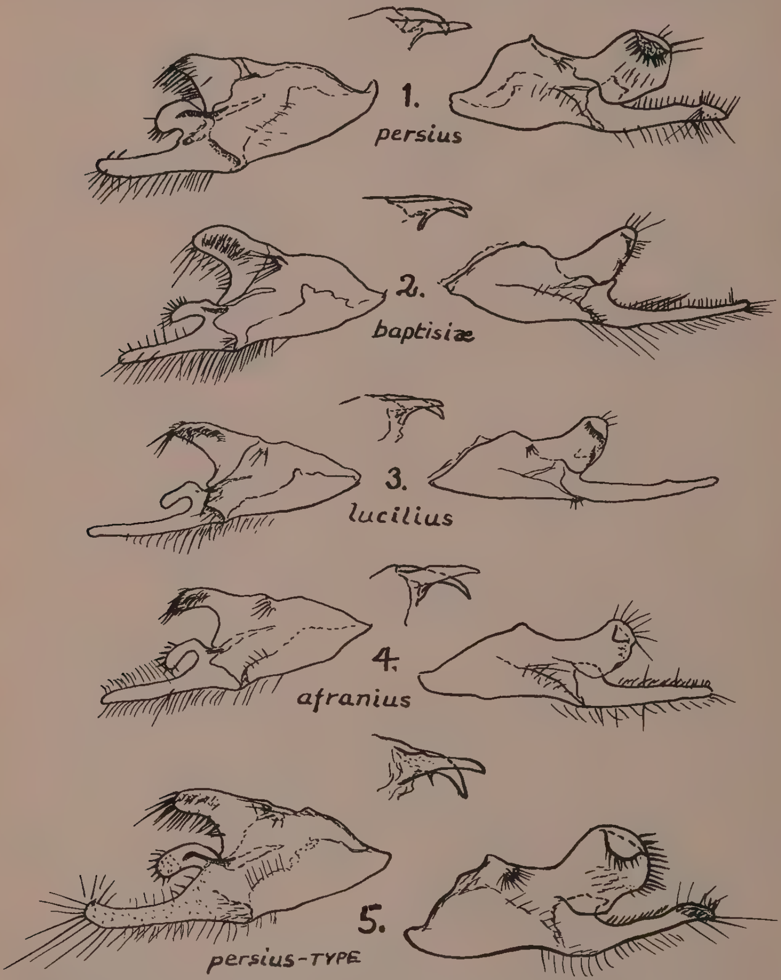

Fig. 1. Each figure shows the left valve on left, tegumen in side view in the center, and right valve at right. 1, *T. persius*, Bristol, R. I. 2, *T. baptisiæ*, type, Woods Hole, Mass.; 3, *T. lucilius*, Ithaca, N. Y.; 4, *T. afranius*, Ariz.; 5, *T. persius*, type, Mass.

sent in *afranius*). The hair on the fore wing is all dark or with two or three scattered white hairs in eastern specimens, and seems less dense as a whole; in Arizona it becomes more visible, but seems less than on *persius* from the same neighborhoods. In *afranius*, where there is more hair, the white scaling is also increased in even greater proportion.

Thanaos afranius Lintner

1878. *Nisoniades afranius* Lintner, 30th Rept. N. Y. Mus. Nat. Hist. 175.
1898. *Thanaos afranius* Holland, Butt. Book, pl. xlv fig. 5.
1921. *Thanaos persius*, race *afranius* Lindsey, Univ. Ia. Stud. ix (4), 52 (in part).
1927. *Erynnis afranius* Lindsey, Denison Univ. Bull. Jour. Sci. Lab. xxii, 109 (larva on lupine and discussion).
1927. *Erynnis persius afranius* Comstock, Butt. Calif. 212 (in part), pl. lix, fig. 3 (?, not fig. 2).
1931. *Erynnis afranius* Lindsey, Bell and Williams, Denison Univ. Bull., Jour. Sci. Lab. xxvi. 62 (in part).

This species is intermediate between the preceding and following, but may usually be distinguished from both by its pale gray outer part of the fore wing, with contrasting black markings (as seen by naked eye). In California there is a form with identical structure, however, that is mostly blackish, and should be looked into biologically.

Male genitalia intermediate between *persius* and the other two species, and more variable than either (suggesting possible origin by hybridization). Hair of upper left lobe usually in two distinct rows, both long, and converging to the upper notch, the upper row very dense in the area corresponding to the smaller hair patch of *persius*; sometimes the two rows confused by the presence of considerable hair in the intervening area; right valve more distinctive, similar to *lucilius*, but with the chitinous teeth weak, both on the edge of upper and tip of lower lobes, occasionally not visible on one or both; tip of upper lobe intermediate, almost invariably turning under in a mounted slide as in *persius*, but relatively small. Genitalia as a whole much smaller than in *persius*, there being no overlap in size. The right upper lobe seems to vary a good deal in shape, with very little variation in size (unlike *lucilius*, whose average size is about the same).

Most of the specimens I have seen come from Arizona; there is one before me from Colorado (Oslar).

Thanaos lucilius Scudder and Burgess

1870. *Nisoniades lucilius* Scudder and Burgess, Proc. Boston Soc. Nat. Hist., xiii, 287, fig. 2 (male genitalia).
1872. *Nisoniades lucilius* Lintner, 23rd Rept. N. Y. State Lab. Nat. Hist. 162, pl. vii, figs. 1, 2 (Ent. Cont. p. 31).
1873. *Nisoniades lucilius* 24th Rept. N. Y. State Lab. Nat. Hist., 162, 164, 167 etc. (Larva on Aquilegia).
1889. *Thanaos lucilius* Scudder, Butt. E. N. A. ii, 1458-1467, pl. ix, fig. 4, xxxvi, figs. 4-6, etc.
1898. *Thanaos lucilius* Holland, Butt. Book, pl. xlviii, fig. 10.
1921. *Thanaos persius*, race *lucilius* Lindsey, Univ. Ia. Stud. ix (4) 52, (pl. ii, fig. 5; male genitalia probably of this, as *persius*).
1931. *Erynnis lucilius* Lindsey, Bell and Williams, Denison Univ. Bull. Jour. Sci. Lab. xxvi, 62 (pl. xiv. reprinted from preceding).

Bibliography under this name is generally correct, the foodplant serving to tie it down.

Genitalia essentially as in *baptisiæ*, but apparently on the average with the upper lobe of the right valve broader in proportion. Size much more variable than shape (unlike *afranius*) but generally a little smaller than *baptisiæ*, about in proportion to the size of the butterfly.

Superficially *lucilius* has a more purplish tint, the paler areas, especially the one beyond the cell, having even a rosy iridescence in a favorable light (mentioned by Lintner). The average size is smaller, generally under 30 mm. expanse. The blackish markings on the fore wing are apt to be a little narrower; for instance, the ante- and postmedial spots in the submedian area are generally shorter than their distance apart. Scudder separates *lucilius* from *persius* as having "a large, somewhat distinct patch, paler than the ground color, between the cellular and subcostal vitreous spots of the fore wings." This character generally holds against true persius, but is shared by *baptisiæ.* There is very little white hair, if any, in eastern specimens.

Lucilius has been frequently reared, always from Columbine. It has two or three broods. I have examined unmistakeable specimens from as far as Nebraska, but its western extent must be verified by larval determinations. If there is a western strain it has been mixed *with afranius.*

Thanaos baptisiæ new species

1889. 'Not *Thanaos persius*' Scudder, Butt. E. N. A. ii-1473 (larva on Lespedeza, perhaps another species).
1921. *Thanaos persius* Lindsey, Univ. Ia. Stud. ix (4), 52 (in part, including generalities and perhaps figure of genitalia).
1931. *Erynnis persius* Lindsey, Bell and Williams, Denison Univ. Bull., Jour. Sci. Lab. xxvi, 62 (in part, perhaps figure of genitalia, but not discussion of larva).
Thanaos persius of most eastern collections, but not of Scudder).

Similar to *T. lucilius,* so close that a comparative description is in order. Average size slightly larger (mostly over 30 mm.). Ground a more yellow brown; in direct light a dull umber, in favorable light showing just a trace of the purple iridescence of *lucilius.* Pale areas produced mainly by a luteous ground (while in *lucilius* the ground is hardly paler than the dark areas, but there is a higher percent of white scales), but with some white scaling, especially toward costa. Iridescence somewhat less difficult than on dark areas, brassy, in some lights with a distinct greensh tint. In the type, a fully marked specimen, the pale areas are spots antemedially, medially and postmedially in fold, separated by wider dark bars, very faint flecks in cell, fairly complete post medial and subterminal fasciæ (including the submedian spots already mentioned), and much smaller and paler preterminal spots; all these essentially as in *lucilius*, except as noted in color. Hind wing and under side like *lucilius*. Dark males show a blurring and lack of contrast of the paler and darker areas, both of which are umber brown. Rubbed specimens tend to develop an iridescence like that of *lucilius*, but lose the white scaling more completely. Female essentially like male (except lack of costal fold) but as usual paler, more mottled looking, and with a tendency for the paler areas to increase on the outer half of the wing.

Male genitalia (fig. 2) substantially identical with *T. lucilius*. Left valve with upper lobe widely divergent from middle lobe, the spinulation on inner surface forming a band extending about to base of lobe; middle lobe of even width, sharply curved ventrad, with a rudimentary keel on inner face running into its base. Lower lobe slender and somewhat tapering, separated by its width from middle lobe Tubercle at middle of costa with 6 or 8 hairs. Right valve with upper lobe tapering toward tip, not densely spined, the tip not recurved, but bearing on its inner face a sharp raised ridge which is clothed with very fine spinules and granules. A similar ridge along or very close to its outer edge, more granulose than spinulose, and connected with the first by a few granules on the face of the lobe. Middle lobe represented by a small sharp tooth overlying face of upper lobe; lower lobe slender, twice as long as upper lobe, widely divergent and tapering, with distinct terminal teeth. Uncus as usual; the left spine nearly straight and right spine sharply curved, more pointed than in *persius*, but substantially as in lucilius.

Type and paratypes from Woods Hole, Mass., July, Cornell Univ. type no. 1391. Allotype from Decatur, Ill., July, reared from Baptisia (in U. S. National Museum from Barnes coll.). The types were taken in close association with *Baptisia tinctoria*, though the females were not seen actually ovipositing. They hovered most persistently over tiny dwarf plants in the paths. I have also seen specimens that seem to be this from other points in New England, N. Car., Pa., Nebr. and Fla., but prefer not to make them types as none were associated with food plants. A single specimen from Arizona in coll. Townes has the same size and genitalia, and some of the brassy iridescence, but is much overlaid with white. It is certainly not *persius* or *afranius*. There are two broods, in May and July, but spring specimens seem rare.

Thanaos avinoffi Holland

1930. *Thanaos avinoffi* Holland, Ann. Carn. Mus. xix (3), 156.

1931. *Thanaos avinoffi* Holland, Butt. Book (Revised Ed.), 352, pl. li, figs. 28, 29.

1931. *Erynnis avinoffi* Lindsey, Bell and Williams, Denison Univ. Bull., Jour. Sci. Labs. xxvi, 62.

I have examined this only superficially but believe it a race of *persius*, whose food, willow, is a common species in the far north. A superficial examination of *T. propertuis* var. *borealis* Cary, from the Canadian Northwest, inclines me to believe it is also a *persius*-strain, and transitional to *avinoffi*.

NOTES ON NORTH AMERICAN NITIDULIDAE: POCADIUS

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In addition to the four species of Pocadius treated below there are known seven from Asia, two from Brazil, and one each from Argentina, Cuba, Europe, and Africa.

Since *helvolus* extends southward into Mexico and Cuba, and *basalis* and *niger* n. sp. are found in Arizona and New Mexico, these species are probably of Neotropical origin. The California *fulvipennis*, although described from "Mexico," is related to the European *ferrugineus* in the shape and punctation of the elytra, profile of the prosternum, and characters of the female genitalia and is probably of Asiatic origin.

Helvolus, *niger* n. sp. and *basalis* are rather closely related and quite distinct from *fulvipennis*. In the use of the following key, figures 1-4 should be consulted.

1. Prosternum in profile strongly arcuate....*fulvipennis* Er.
   Prosternum in profile moderately arcuate or nearly plane .... 2.
2. Prosternum behind the coxa plane, not deflexed .... *basalis* Schaef.
   Prosternum behind the coxa more or less deflexed....... 3.
3. Pronotum black with hind angles obtusely rounded .... *niger* n. sp.
   Pronotum testaceous to piceous with hind angles acutely rounded .... *helvolus* Er.

Pocadius fulvipennis Erichson

Pocadius fulvipennis Erichson, 1843, in Germar, Zeitschr. Ent., 4: 319.

Pocadius dorsalis Horn, 1879, Trans. Amer. Ent. Soc., 7: 311.

The color varies from black with a red basal spot on each elytron to testaceous. This species was described from "Mexico." *Dorsalis* was based on the black form. In the United States it is found only in California ranging from Los Angeles Co. to an altitude of 2,500 feet, Carrville, Trinity Co. The Carrville specimens are dated June 19. In Mr. H. C. Fall's collection is a specimen collected on March 17 in Marin Co. from the "puff ball *Lycoperdon giganteum.*"

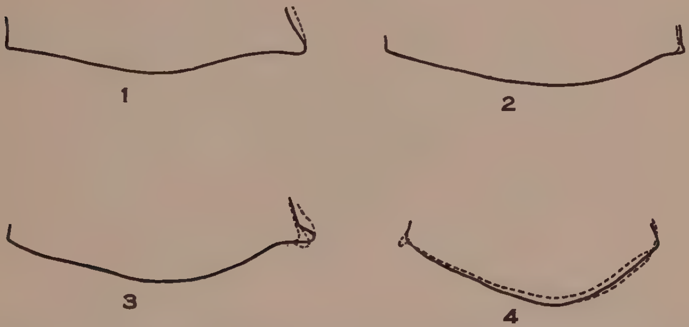

Fig. 1. Profile of the prosternum in *Pocadius.* The dotted lines show the extent of variation. 1, *P. basalis*, holotype in solid line; 2, *P. niger* n. sp., holotype in solid line; 3, *P. helvolus*, the usual form in solid line; 4, *P. fulvipennis*, lectotype of *P. dorsalis* in solid line. This is the usual form; the least arcuate outline in Fig. 4 is identical with that of the European *P. ferrugineus.*

Pocadius helvolus Erichson

Pocadius helvolus Erichson, 1843, in Germar, Zeitschr. Ent., 4: 320.

Pocadius breviusculus Reitter, 1876, Stettiner Ent. Zeit, 37: 318.

Pocadius ferrugineus Chevr., 1863, Am. Soc. Ent. France (4) 3: 604 (in error).

Pocadius infuscatus Reitter, 1874, Syst. Eintheil. Nitid., p. 94.

Pocadius limbatus Reitter, 1874, Syst. Eintheil. Nitid., p. 95.

Helvolus varies considerably in size, punctation, and color, ranging from pale testaceous to dark rufo-testaceous with the elytra black except at base. As a result Reitter has named three forms. In the Horn collection there are specimens compared with Reitter's types, and since these variations have no geographical significance they had better remain synonyms as Horn placed them.

Described from "North America" *helvolus* ranges from Stamford, Connecticut and West Point, New York to Thomasville, Georgia west to "B. C." (H. C. Fall coll.), "Montana" (Sharp), Nebraska, Kansas, eastern Texas (Columbus and Houston), and northwards to Aweme, Manitoba. The dates run from June to September. Specimens from New Jersey received from Mr. C. A. Frost were taken in *Lycoperdon giganteum.* It is recorded from Cuba by Chevrolat (under *ferrugineus*) and by Reitter (as *infuscatus* and *limbatus*). Sharp recorded this species from Mexico (Durango and Guanajuata).

Pocadius niger new species

Fig. 1 (*2*), Fig. 2 (*7*)

Broadly oval, robust; head and pronotum black, elsewhere dark piceous except for a somewhat triangular reddish brown spot on each elytron. Head coarsely irregularly punctured; front transversely impressed. Thorax as wide as long, narrowed in front; apex rather strongly emarginate; base arcuate, and feebly sinuate at each side. The sides of the thorax moderately and evenly arcuate, narrowly inflexed; hind angles obtusely rounded; disc convex, coarsely irregularly punctured. Sides of elytra feebly arcuate, apex truncately arcuate, sutural angle feebly dentiform; disc convex, with ten rows of distinct punctures (obscure near the sutural margin in the Arizona specimens); the intervals flat, irregularly biseriately punctulate, each puncture with a fulvous hair. Body beneath coarsely sparsely punctured. Length 4.3-3.2 mm., width 2.2-1.9 mm.

Described from thirteen specimens collected by Barber and Schwartz on June 8 at Las Vegas Hot Springs, New Mexico. The male holotype, allotype, and 6 paratypes in the U.S.N.M., one pair of paratypes in the Mus. Comp. Zoöl. and one paratype each in the collections of H. C. Fall and the writer. Also one paratype from the Pinal Mts., Arizona and one paratype from the Sierra Ancha Mts., Arizona in the collection of H. C. Fall.

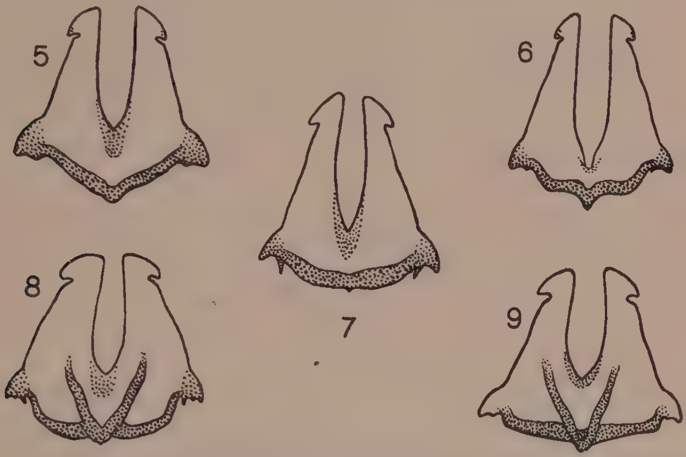

Fig. 2. Ventral views of the coxites of the female genitalia in Pocadius. 5, *P. basalis* Schaeffer (topotype); 6, *P. helvolus* Er.; 7, *P. niger* n. sp. (paratype); 8, *P. ferrugineus* L.; 9, *P. fulvipennis* Er.

This is the species listed by Fall and Cockerell in their New Mexican list as *fulvipennis*. In the profile of the prosternum, and characters of the female genitalia this species is intermediate between *helvolus* and *basalis*. It differs from both of them by being less oval, the prothorax black, more convex, with narrower margin, and more obtuse hind angles. The pubescence is longer and the punctation of the elytra, at least in the New Mexican specimens, more regular and distinct.

Pocadius basalis Schaeffer

Pocadius basalis Schaeffer, 1911, Journ. New York Ent. Soc., 19: 117.

Holotype and three paratypes labelled "VIII. 29, Huach. Mts. Ariz." and one without label are in the U.S.N.M. One female from the "Huach. Mts., Ariz," is in the writer's collection and evidently was collected with the types. There is no variation in these six specimens. *Niger* n. sp. approaches *basalis* in the punctation of the elytra, but this character is very variable in *helvolus* and the European *ferrugineus*.

For the privilege of examining material the writer is greatly indebted to E. A. Chapin (U.S.N.M.), P. J. Darlington (M.C.Z.), E. C. Van Dyke (Cal. Acad. Sci.), E. T. Cresson, Jr. (Phil. Acad. Sci.), H. C. Fall, and C. A. Frost.

A NEW LOCATION FOR PERIPATUS IN JAMAICA

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The Johns Hopkins University

The Island of Jamaica, B. W. I., is the habitat of two members of the Onychophora one of which, *Peripatus swainsonæ* Cockerell, is an endemic species, while the other, *Plicatoperipatus jamaicensis* (Grabham and Cockerell), is the sole representative of an endemic sub-genus. The history of the discovery of these animals and the facts as to their known distribution in Jamaica have recently been reviewed by E. A. Andrews (1933) and will be only briefly summarized here. The first recorded specimens from the island were collected by Philip Henry Gosse (1851) at Bluefields in the southwestern part of Jamaica, but were not at that time described as new. Forty years later (Grabham and Cockerell, 1892) Peripatus was again reported from Jamaica but from quite a different locality, near Bath in the southeastern portion of the island. These specimens were assigned to a new series. *Peripatus jamaicensis*, and Gosse's original collections were assumed to represent the same. During the succeeding years several hundreds of specimens were obtained from the Bath region and when critically examined by Bouvier they were found to belong to two distinct species. *Peripatus jamaicensis* was present in considerable numbers but the majority of the specimens were regarded as representing a new variety of the species *Peripatus juliformis* Guilding which received the name *P. juliformis* var. *swainsonæ* Cockerell and is so designated in Bouvier's (1905) monograph of the group. Gosse's original collection, of which three specimens were still extant in the British Museum, was also found to contain representatives of both these forms. Later in Clark's (1913) revision of the American species of Peripatus, a new sub-genus, *Plicatoperipatus*, was erected for the reception of the species *P. jamaicensis* and the variety *swainsonæ* was elevated to specific rank under *Peripatus s. s.* In the time which has elapsed since the discovery of Peripatus at Bath, single specimens have been found at three other widely separated localities on the island. F. S. Conant collected an example of *P. jamaicensis* at Blue Hole near Port Antonio on the north coast in the summer of 1897; E. A. Andrews found *P. swainsonæ* near the Great River east of Montego Bay in 1910 and again at a locality very near Kingston, above Constant Springs, in 1932. All three of these specimens are to be found in the museum collection of the Johns Hopkins University. Peripatus has thus far been taken at five widely separated points in Jamaica which, if connected by straight lines, would surround an area embracing more than half the island. However, as Andrews points out, it is by no means certain that the animal occurs in all or much of this intermediate area. All five of the known localities are at relatively low altitudes, 1,000 feet or less, and the presence of Peripatus in the central mountain chain with its highest peaks rising to over 7,000 feet, has remained to be established.

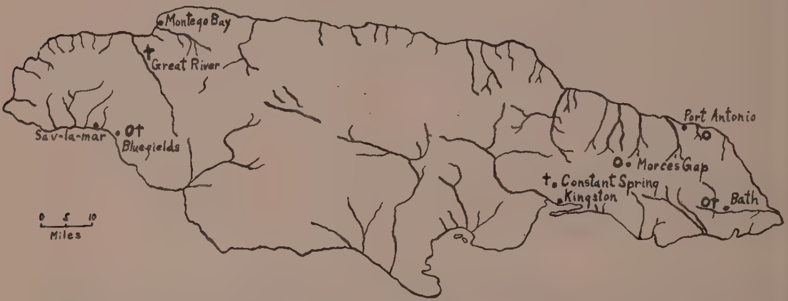

Figure 1—Outline map of Jamaica showing the six known localities for the Onychophora in that island. + = *Peripatus swainsonae*; O = *Plicatoperipatus jamaicensis*.

It was therefore with great interest that the writer, during the past summer, came upon Peripatus in the heart of the Blue Mountains at an altitude of nearly 5,000 feet. While collecting the eggs of the toad *Eleutherodactylus nubicola* (in connection with an embryological study aided by a grant from the National Research Council) a specimen of *Plicatoperipatus jamaicensis* was found beneath a rock near Morce's Gap. This gap is located between John Crow Peak and Bellevue Peak in the Parish of Portland at an elevation of 4,980 feet. It is but two miles north of the Cinchona plantation and through it passes the trail which leads from Silver Hill to Orange Bay. It is located in the region of perpetual rain-forest with an annual rainfall of 105.70 inches (Shreve, 1914). The specimen herein described was found only about one hundred yards from the gap, beside the trail which leads to Trafalgar Gap, the "Vinegar Hill Trail." Upon turning a rock the animal was seen crawling about slowly on a bare stone in the neighborhood of a few dead leaves. The ground was somewhat dry at this time, there having been no rain for several days. The specimen was induced to crawl upon a leaf and was then placed in an 8 oz. collecting jar without handling. However, when a portion of the animal's skin touched the collecting bottle a whitish substance was given off at the point of contact and two large drops also appeared at the openings of the mucous glands on the oral papillæ. An examination of the bottle revealed that it was one in which an alcoholic specimen had previously been kept and that it still retained a slight trace of alcohol odor. The Peripatus was immediately transferred to a clean bottle in which it was carried without harm for the rest of the day. The portion of the body which had come into contact with the wall of the first bottle formed a whitish blister-like swelling, however, which may be seen in the photographs (Fig. 2) and still remains in the preserved specimen. The animal was collected at about 2 P.M. on July 21. It was carried about during the rest of the day's collecting and was successfully transported to Chester Vale, some three miles distant, where it was photographed the same afternoon. It was kept in a large jar with a plentiful supply of dead leaves, the jar being wrapped in a moist cloth to give coolness and darkness. Here it remained quite active, moving about among the leaves and seemingly carrying on a normal existence. On July 27 it was preserved in Bouin's Fluid for sectioning. Before being preserved it was killed by exposure to the fumes of chloroform. At this time it threw out its viscid white mucous from the oral papillæ to a distance of three inches and several thread-like strands of the substance also appeared from the posterior mucous glands. It had not been seen to do this during the week it was under observation which may lead to the conclusion that it did not feed, since Mme. Claude-Joseph (1928) describes the use of this substance in the capture of prey. When the specimen was immersed in Bouin's solution it was

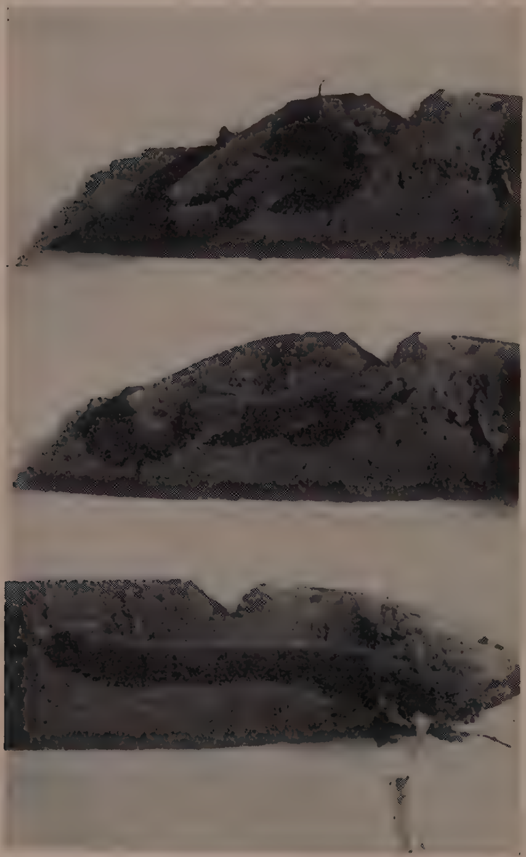

Figure 2. Three successive photographs of *Plicatoperipatus jamaicensis* crawling upon a leaf. Metric beneath lower figure.

found to be completely coated dorsally by a thin film of air and it was only when warm Bouin's was employed that a proper preservation was insured. The power of the skin of Peripatus to repel moisture by means of the coating of air which forms about the papillæ has frequently been noted (Claude-Joseph 1928, Andrews 1933). During life the animal was dark reddish-brown above and pinkish beneath; the papillæ appearing as an obscure peppering of light spots over the whole surface, with however some indication of an arrangement in four longitudinal rows on the dorsal side. Faint light stripes encircled the body opposite each pair of legs. The antennæ were brown with striking white tips (Fig. 2, lower photo) and were constantly moving about in all directions, sometimes even crossing each other. The body was 61 mm. long when extended; the antennæ about 5 mm. As preserved the body is contracted to 45 mm. and the antennæ to 3 mm. The individual is a female and has 38 pairs of legs. Only this one specimen was found even though much time was spent during June and July in turning rocks in this same general locality while collecting frog eggs. Possibly, however, a search in dead trees and logs would have revealed more specimens. Mme. Claude-Joseph found the Chilean species *Opisthopatus* (*Metaperipatus*) *blainvillei* quite commonly under the bark of dead tree trunks though it occurred only very rarely beneath stones and logs.

This sixth locality for Peripatus in Jamaica seems especially worthy of note since it lies within the area surrounded by the other known regions where Peripatus occurs, and in the heart of the Blue Mountains almost exactly mid-way between the north and south coasts. This apparently constitutes the first record of any member of the Onychopora from the Blue Mountain Range proper. Gosse's place of original discovery, Bluefields, is some eighty miles from the nearest part of the Blue Mountain chain and the three localities reported by Andrews (1911, 1933) are all in the lowlands near the coast. The Bath region lies in the foothills of the extreme eastern end of the Blue Mountain chain. In this connection attention may be called to a recent statement by Dr. C. T. Brues (1935) to the effect that "The occurence of Onychophora in Jamaica is, however, so far as known, restricted to the Blue Mountains as none have been discovered in other parts of the island." Possibly this error is based upon a misunderstanding as to the locality of Bluefields, which in spite of the name is far distant from the Blue Mountains.

The great altitudinal range of *Plicatoperipatus jamaicensis* revealed by the present record is noteworthy. Unfortunately exact altitude records have not been given for most of the 60 or 70 described species of Peripatus. The greatest elevation reached by any species seems to be that attained by *Paraperipatus lorenzi* Horst which was reported from the Wichmann Mts. of Dutch New Guinea at 10,000 feet. *Oroperipatus cameranoi* (Bouvier) was collected in the region of Sigsig and Cuenca, Ecuador at an altitude of 2,550 meters (7,287 feet) and *Peripatus manni* Brues was recently recorded from near La Vesite, La Salle Plateau, Haiti at 5,000-7,000 feet. *Peripatoides* (*Ooperipatus*) *oviparus* (Dendy) is known from a number of localities in Victoria and New South Wales, Australia and Helms (1890) records it from Mt. Kosciusko in the latter province at an altitude of 5,700 feet, in a region frequently covered with several feet of snow for four or five months in the year. In addition to these Onychophora which are definitely recorded at considerable elevations in various parts of the world it is quite probable that a number of others of the Andean and Australasian forms may have come from comparable altitudes and that a careful check-up of the elevations of all the localities from which they are reported would reveal this. As to the altitudinal distribution of single species, however, less information is available. The present record extends the range of *P. jamaicensis* from sea level (the Blue Hole locality) to 5,000 feet. This range is rivaled by that of another Caribbean form *Epiperipatus biolleyi* (Bouvier) from Costa Rica which was found by M. P. Biolley near San Matteo at 250 meters and later by Picado at an altitude of 2,000 meters. Other instances of comparable ranges could undoubtedly be culled from the literature. For example *Peripatopsis moseleyi* Wood-Mason, which is found at Riet Vlei, Natal, at 5,000 feet has also been collected near Port Elisabeth, Cape Colony, a seaport town; *Peripatoides oviparus* (Dendy) is not only recorded from Mt. Kosciusko but also from Pyalong and Warburton in Victoria, localities for which the International Map of the World shows altitudes of 200-300 meters; *Oroperipatus corradoi* (Camerano) comes from the Quito plain in Ecuador which is at 9,500 feet altitude but it is also reported from near Guayaquil on the coast. The ability of Peripatus to withstand the great range of conditions to which it must be subjected at these various altitudes would seem to be worthy of consideration in relation to the problem of dispersal of this animal. Also, the fact that individuals showing the same specific characters are found inhabiting such diverse regions may be regarded as further evidence of the very slight tendency towards speciation in this group, which has resulted in its retention of so many primitive characteristics.

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NOTES ON SOME HYDROPSYCHIDÆ

BY NATHAN BANKS

Mr. Milne's third part of his Studies of Trichoptera having appeared and finishing the series, I offer certain remarks thereon, particularly on some Hydropsychidæ. Somewhat similar criticisms can be made of various other parts. Mr. Milne has on several occasions credited me with placing a name as a synonym when it was first done by others.

Thus under *Hydropsyche alternans* Walk. he puts *H. morosa* Bks. (nec. Hag.) as synonym. Now four years before I was born Hagen himself in his Phryganidarum Synopsis Synonomyica, p. 25, 1864, puts his *H. morosa* as equal to *alternans* Walk. McLachlan had indicated it the year before. Both I and Ulmer have simply accepted the dictum of Hagen and McLachlan.

In the type series of *H. morosa* now in the Museum there are five specimens of *alternans* and three of a *Cheumatopsyche* from Red River of the North. These three do not agree well with the description, but Milne has taken them to bear the name *morosa*. Therefore to keep the name *morosa* as Hagen, Ulmer, and I have kept it for seventy years, I have selected and marked as lectotpye of *Hydropsyche morosa* Hagen a male from "St. Lorenz, Canada, Sacken 1859," which is what has been commonly called *alternans* Walk. The three *Cheumatopsyche* from Red River are near to some of Hagen's types of *H. phalerata*. But since Ulmer has figured[1] (Selys Monographs fasc. VI, p. 66, 1907) a species of Hydropsyche as Hagen's *H. phalerata* (and some of Hagen's types were of this form) I have selected and marked as lectotype *Hydropsyche phalerata* Hagen a specimen from "Washington, Sacken," which is the species figured by Ulmer. This is much smaller than the others of the *scalaris* group, with larger, fewer pale spots, and eyes of male wider apart than the diameter of an eye.

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[1] His dorsal figure shows apical joint of claspers too long.

Following Ulmer, Martynov, Mosely, Navás, and Betten I am separating *Cheumatopsyche* (that is the *Hydropsychodes* of these authors) on the character used by Betten, the position of certain cross-veins; this appears to be constant.

Mosely informs me that the type species of *Hydropsychodes* has no closed median cell, and that Ulmer's figure is wrong; in any event *Cheumatopsyche* is an older name.

Another case is where I am credited with putting *H. dubitans* as a synonym of *N. crepuscularis,* although I had simply followed the statement of McLachlan (Revision European Trichoptera, p. 393, 1878) who had seen the types of both names. As to Walker's *Polycentropus crassicornis,* put as a synonym of *N. crepuscularis,* I examined a type in 1912 and saw that it was a *Phylocentropus.* Mr. Mosely informs me there are four types in the series, two (a male and female) of a *Plectrocnemia,* one female of a *Phylocentropus,* and one male of a *Neureclipsis.*

Mosley thinks (and I agree) that the name should be kept for the *Plectrocnemia,* and I select as lectotype of *Polycentropus crassicornis* Walk. a male in the type series which is a *Plectrocnemia;* all types are from Georgia.

Milne lumps under *H. scalaris* about all the forms that have the same general structure of the penis, ignoring further differences. In the male type of *H. scalaris* the apical joint of the clasper has a distinct hook at the end; the eyes of the male, although larger than in the female, are wider apart than the width of an eye. Betten, in sinking my *H. hageni,* has called attention to Hagen's statement that the eyes of the male *scalaris* were larger than the female. This is but a half-truth, for Hagen also says after the descripton that he has a male with still larger eyes, and adds "Is it different?".

I have selected and marked as lectotype of *Hydropsyche scalaris* Hagen a male from "St. Lorenz, Canada, Sacken." *H. hageni* is smaller and darker than *H. scalaris,* the male eyes are less than the width of an eye apart. It is common in southern localities where the typical *scalaris* is not found. The last joint of the clasper is shorter and broader than in *scalaris*.

H. incommoda Hagen from Georgia is also put as a synonym by Milne. The superior plate is more nearly conical, with only a short incision, the apical joint of the clasper has the hook less distinct. The eyes of male are wide apart, further apart than in *H. scalaris*. It occurs also in Louisiana.

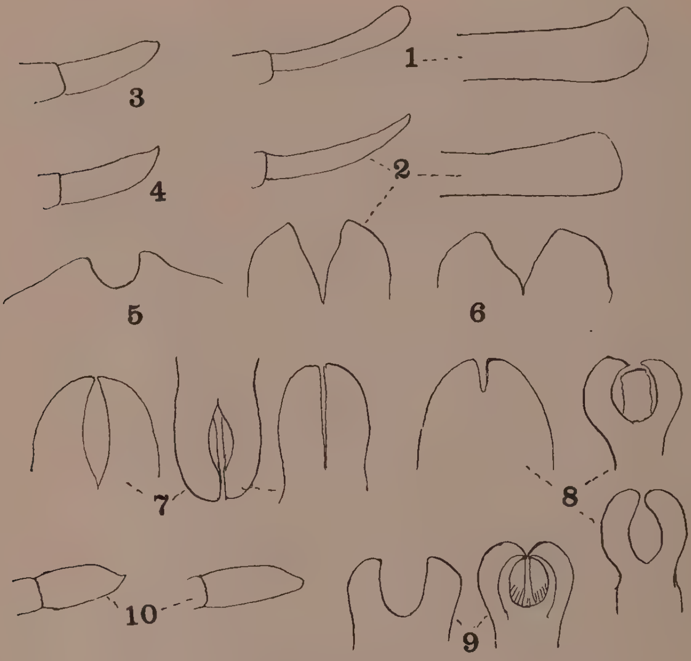

Fig. 1. Male genitalia of Hydropsyche. 1, *H. separata*, clasper and penis; 2, *H. reciproca*, clasper and penis, and superior plate; 3, *H. incommoda*, clasper; 4, *H. scalaris*, clasper; 5, *H. separata*, superior plate; 6, *H. depravata*, superior plate; 7, *H. scalaris*, superior plate, penis below and above; 8, *H. incommoda*, superior plate, penis, two specimens; 9, *H. phalerata*, superior plate, penis; 10, *H. hageni*, clasper, apical joint.

There are minor differences in these four forms, all of which, *scalaris hageni, incommoda, phalerata,* I consider distinct species, judging by the characters used in the separation of European species.

Mr. Milne has put at least two (perhaps three) forms under *Hydropsyche depravata* Hagen. *H. depravata* was described from a female from Georgia; a male from Georgia (same handwriting) appears to be the same species and Milne makes it the neoallotype. This has the apical part of the clasper slender, curved, and scarcely narrowed toward tip; the superior plate has a deep, triangular emargination.

In New England, Eastern New York, and Pennsylvania there is a fairly common species of the same group as *H. depravata.* It is as large as *H. scalaris,* darker and with more numerous and smaller spots, and in the male the eyes widely separated. The female is readily separated from *H. scalaris* by having the mid basitarsus dark and scarcely swollen (in *scalaris* extremely broad and very pale).

The apical part of the clasper is hardly as long as in *H. depravata* and plainly tapering toward the tip; the superior plate is deeply, acutely indented, the lobe each side being narrowed near the tip and pointed. This is probably *H. reciproca* Walk., and I shall so consider it. The type of Walker's species is a female and has lost the middle legs. *H. depravata* is probably the same.

From the western part of New York and further west is a form similar in size and markings. The superior plate has only a rather shallow, rounded emargination, and the apical part of the clasper is plainly somewhat clavate totoward tip. This is certainly a different form from the Eastern species and I have named it

Hydropsyche separata sp. nov.

The fore wings are much spotted with gray, few in extreme apical part; the penis, seen from side, is rounded at tip, slightly swollen and almost pointed above (in *recip-*

roca not at all pointed above) ; the superior plate has a median rounded emargination, which when not shriveled, is as wide as deep; the male eyes wide apart. Apical part of claspers slightly enlarged at tip. The female has the mid basitarsus dark and but little swollen. The fore wing is 11 mm. long.

Type (and paratypes) from Westfield, N. Y., June and July 1905 (Woglum coll.). Others are from Saskatchewan, Scudder.

Polycentropus confusus Hagen was described from three specimens, two from Trenton Falls N. Y., and a female from Washington, D. C. One, a female, from Trenton Falls, N. Y. has the discal cell in the hind wings closed and is a *Plectrocnemia,* and is so treated by Betten, necessitating a change in *Plectrocnemia confusa,* Mosely. This specimen when I first saw the collection and until lately was the first specimen in the row. But the other specimen from Trenton Falls, N. Y. is a male, a true *Polycentropus.* In 1914 (Can. Ent.) I figured the genitalia of this species as *Polycentropus confusus;* I have therefore selected this Trenton Falls male as lectotype of *Polycentropus confusus* Hagen and so marked it. Thus Mosely's *Plectrocnemia* will not need renaming.

The selection of these lectotypes will result in keeping several of the Hagen names as they have been treated and figured, which, I believe, is better than to make the changes which have recently been put forward, and in each case the specific names is retained in the genus in which Hagen described it.

PSYCHE

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